Management of low-grade glioma : a systematic review and meta-analysis

Brown, Timothy J ; Bota, Daniela A ; van Den Bent, Martin J ; Brown, Paul D ; Maher, Elizabeth ; Aregawi, Dawit ; Liau, Linda M ; Buckner, Jan C ; Weller, Michael ; Berger, Mitchel S ; Glantz, Michael

Abstract: Background Optimum management of low-grade gliomas remains controversial, and widespread practice variation exists. This evidence-based meta-analysis evaluates the association of extent of resection, radiation, and chemotherapy with mortality and progression-free survival at 2, 5, and 10 years in patients with low-grade glioma. Methods A quantitative systematic review was performed. Inclusion criteria included controlled trials of newly diagnosed low-grade (World Health Organization Grades I and II) gliomas in adults. Eligible studies were identified, assigned a level of evidence for every endpoint considered, and analyzed according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. The relative risk of mortality and of progression at 2, 5, and 10 years was calculated for patients undergoing resection (gross total, subtotal, or biopsy), radiation, or chemotherapy. Results Gross total resection was significantly associated with decreased mortality and likelihood of progression at all time points compared to subtotal resection. Early radiation was not associated with decreased mortality; however, progression-free survival was better at 5 years compared to patients receiving delayed or no radiation. Chemotherapy was associated with decreased mortality at 5 and 10 years in the high-quality literature. Progression-free survival was better at 5 and 10 years compared to patients who did not receive chemotherapy. In patients with isocitrate dehydrogenase 1 gene () R132H mutations receiving chemotherapy, progression-free survival was better at 2 and 5 years than in patients with wild-type gliomas. Conclusions Results from this review, the first to quantify differences in outcome associated with surgery, radiation, and chemotherapy in patients with low-grade gliomas, can be used to inform evidence-based management and future clinical trials.

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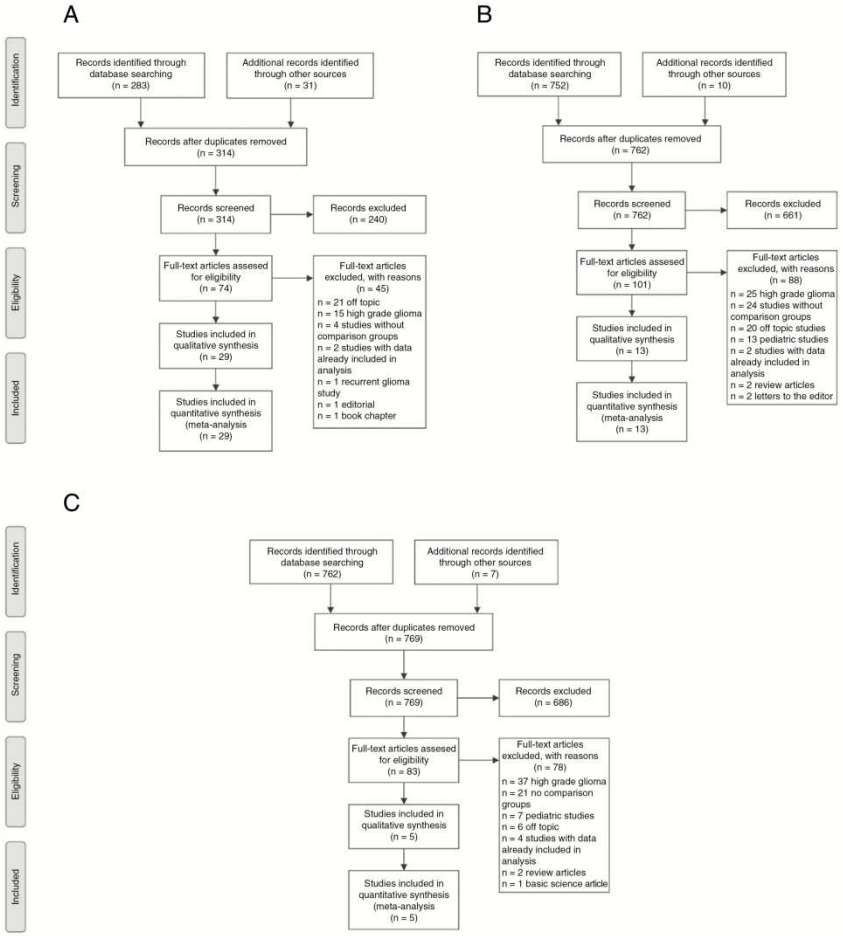

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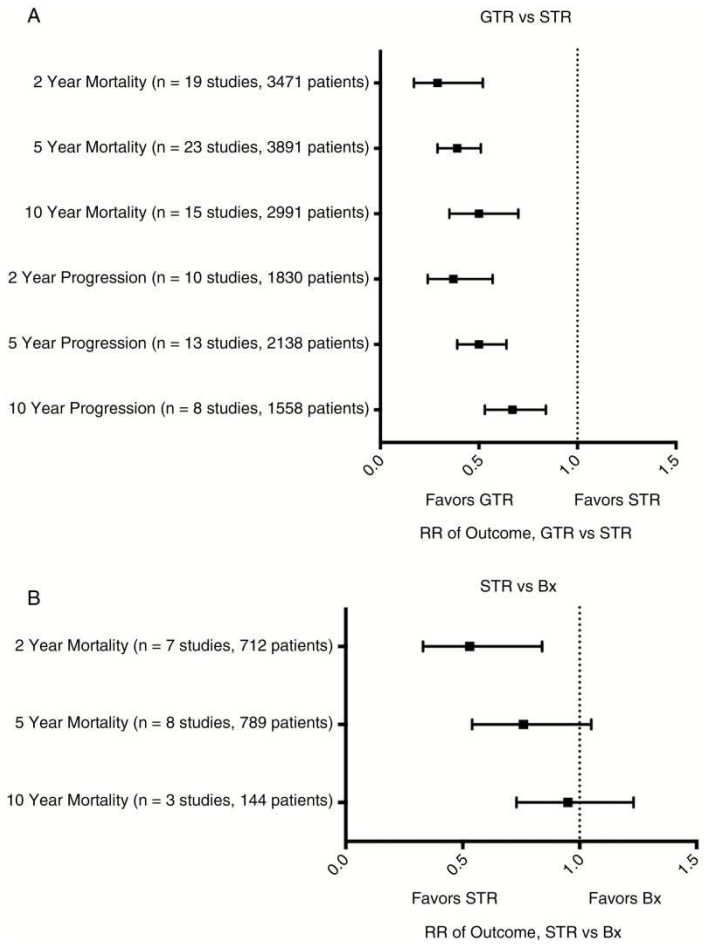

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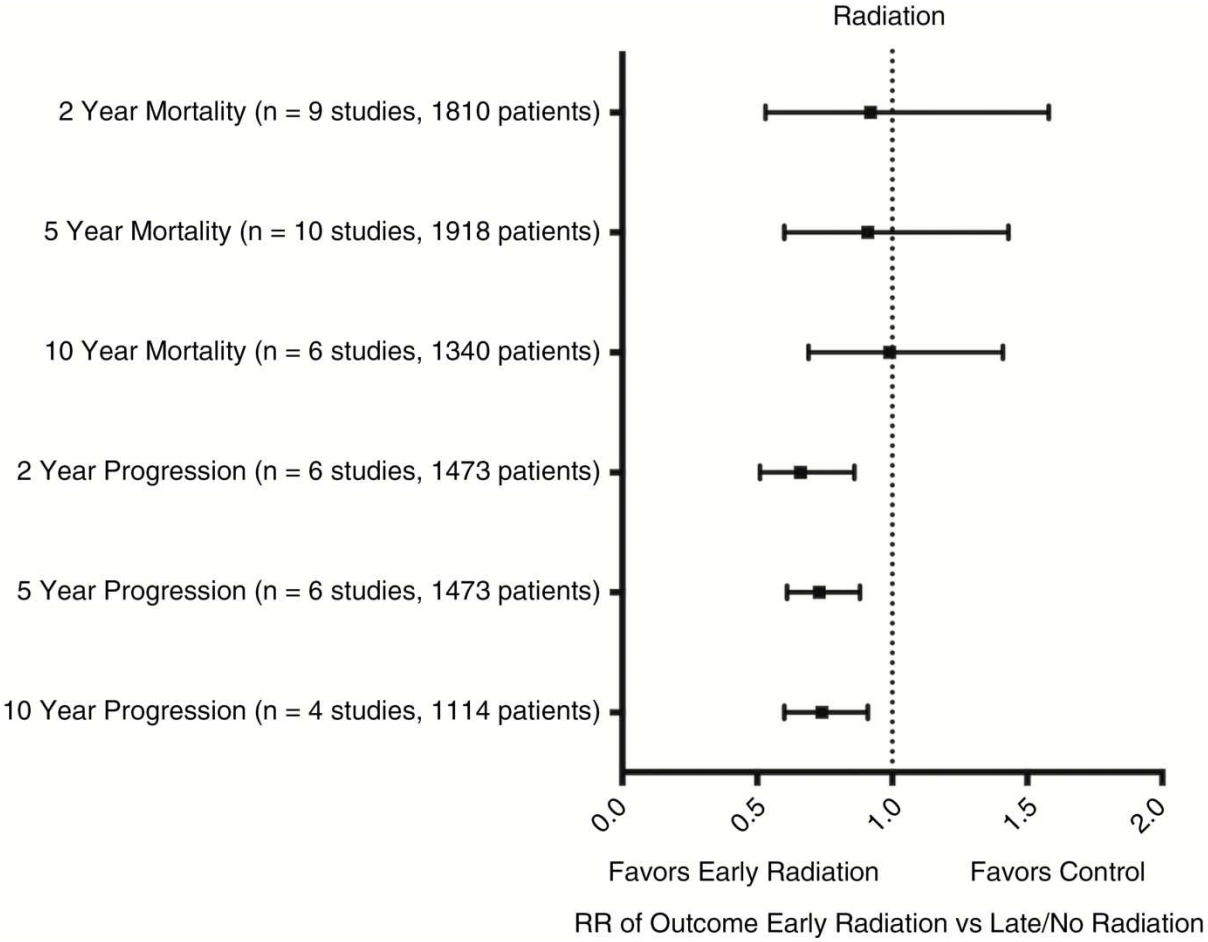

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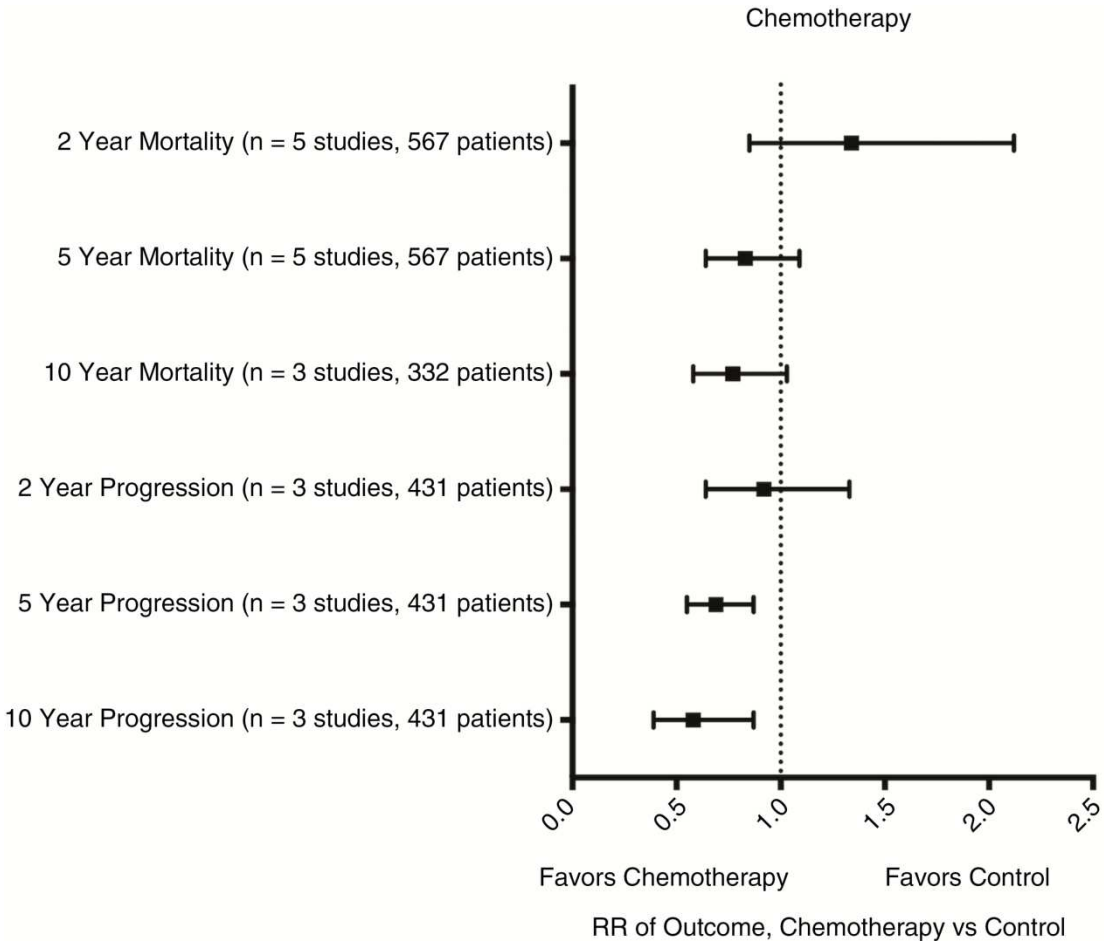

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